

# SCIENCE

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FRIDAY, JULY 20, 1888.

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WHEN THE SYSTEMATIC STUDY of Indian pictographs was begun by the Bureau of Ethnology years ago, it was supposed by those who collected the material that the carvings on rocks and wood, on barks and skins, when they were interpreted, would tell something of the history of the people who made them, as the hieroglyphics of the East have enabled modern scholars to construct the history of ancient dynasties and empires. This expectation has been disappointed. The Indian pictographs are either mythological, or, if they relate to events, it is to incidents in the lives of individuals who are not identified, such as his hunts, the number of scalps he took in battle, etc., or to such events in the history of the tribes as the great religious festivals. They throw no direct light upon the origin, age, or migrations of the tribes that made the pictographs. Indirectly, by the comparative study of the characters made by different tribes, the relations of those tribes may be determined. It is by this comparative study that the Indian pictographs are likely to prove most valuable to science.

THERE HAVE OCCASIONALLY been assembled, at intervals of from five to seven years, international congresses for the discussion of questions relating to crime and penal discipline. At those hitherto held, as at Frankfort, Brussels, London, Stockholm, and Rome, there has been a union of both official and non-official members, with similar privileges of voting on the questions at issue. The next congress is appointed to be held some years hence, at St. Petersburg. It would appear as if the spirit of Russian despotism had taken alarm at the proposal, although unwilling to prohibit such a meeting. But certain influences have been brought to bear upon the committee of arrangement, who have intimated a desire to restrict future decisions on the various questions to official delegates or State functionaries. These, in Russia and some other continental countries, are obsequious servants of the bureaucracy. Hence, if this intention is carried out, the congress may in such hands tend to become a mere clique, or the creature of conditional patronage of northern military despotism, and, as such, rather likely to meet with ridicule than respect from the free public opinion and intelligence of western Europe and America. The French Prison Society, Paris, has already issued a timely protest against this project. That society consists of some of the ablest and most intelligent members of the legislature and scientific bodies of France, and is highly respected at home and abroad. Its objections to the proposed change in the constitution of these congresses will doubtless obtain acceptance in Great Britain and America, and in free nations generally. If, in defiance of such opinion, the St. Petersburg congress is to be manipulated as proposed, its proceedings will be entitled to comparatively little consideration.

THE BILL TO PROVIDE for the eleventh and subsequent censuses has been passed by the House of Representatives, and will no doubt be adopted by the Senate before the adjournment of the present session. The salient features of the bill are similar to those of that which provided for taking the tenth census, except that the number of subjects of investigation are reduced to seven. These are population and social statistics relating thereto, manufactures, mining, agriculture, mortality and vital statistics, valuation, and public indebtedness. The statistics on other subjects included in

the tenth census, and which swelled its publications to twenty-two large quarto volumes, although very useful for general information, political discussion, and social science, are omitted because the same information may be gathered by and published from other bureaus of the government more satisfactorily and more economically. They are of continuing importance, and are not limited to the precise period when the census is taken. The number of volumes to be printed will probably be reduced to seven, and their publication will not be delayed as formerly.

THERE WILL BE HELD next year, during the Universal Exhibition in Paris, a large number of scientific congresses, — of zoölogy, anthropology, physiology, electricity, dermatology, and hygiene, — besides the literary congresses and those devoted to economics and the arts. The exhibition will draw to Paris a large number of strangers, and will therefore be a favorable occasion for these international re-unions. It is to be hoped that the scientific congresses of 1889 will be as satisfactory in their results as those previously held. As an admirable model, we would call attention to the International Electrical Congress of 1881. This congress decided upon a reform in electrical measures. Up to that time, each experimenter had employed that system of measures which best served his purpose. Thanks to the electrical congress, these variations are now at an end. In order that the congresses of 1889 may accomplish all that may be expected of them, it is desirable that programmes should be arranged well beforehand, and the scientific world will look to the organizers of the congresses for this needed guidance. In large part the proper organization of the congresses will depend upon the local scientific societies of Paris.

THE LARGE AMOUNT of light sandy soils in some of the northern counties of Michigan which do not appear to respond favorably to ordinary methods of tillage, seems to call for investigation and experimental inquiry. Some persons doubt the possibility of their successful cultivation, and are disposed to scoff at all attempts in that direction. The fact that many persons have settled on these lands for homesteads, and after a few years have abandoned their claims and gone elsewhere for permanent homes, seems to countenance the doubt about their agricultural value. The hundreds of abandoned homesteads give sad evidence of misdirected labor and disappointed hopes. The question is, how to bring these lands into profitable cultivation by such methods of tillage and the use of such manurial materials as are within the reach of every farmer of moderate means. It does not include the use of stable-manure, for the reason that this cannot at present be obtained in sufficient quantity to supply the needs of the plains. No one need doubt the capacity of these sandy soils to produce crops if a sufficient supply of stable-manure can be obtained. The first question is, how to raise the crops on these lands that shall furnish the stable-manure. The problem briefly stated is this : with a light sandy soil of very porous quality, in a northern climate, subject to late frosts in spring and early frosts in autumn, and liable to midsummer drought, with no fertilizers except marl, salt, and plaster, can any methods of tillage or kinds of crops bring these plains into profitable cultivation for ordinary farming, stock-raising, or fruit-production ? For many years Prof. R. C. Kedzie of the Agricultural College of Michigan has given thought and study to this problem, and in lectures and articles called attention to the subject. When the Hatch Bill became a law, it was felt that the time had come to take up this sub-

ject in a practical way. A farmers' institute had been held at Grayling, Crawford County, in which farming on the plains occupied most of the time and thought of those present. When it was determined to establish an experimental farm on the plains, the State Board of Agriculture fixed upon Grayling as the place, because it is in the heart of the jack-pine lands, is readily accessible by railway, is near a large deposit of marl, the people take a lively interest in the experimental work, and the Michigan Central Railroad offered to donate eighty acres of jack-pine land for the experimental farm. The tract of land donated, both as to soil and the natural products growing on it, is considered a fair average of the jack-pine plains. The experimental work at Grayling is only begun, and it is too soon to ask, "What shall the harvest be?"

THE STORRS SCHOOL Agricultural Experiment Station, Mansfield, Conn., has issued its first bulletin. The purpose of this bulletin is to explain to the public whom the station is especially intended to serve, the organization of the station, its spirit, and the character of the work thus far begun. It is the wish of those in charge of the enterprise to make its connection with the farmers of the State as intimate as possible, and to this end copies are mailed to all farmers in Connecticut whose addresses the station has been able to obtain, to a number of other persons within and outside of the State, as well as to the press. By the act of Congress, provision is made for the appropriation of fifteen thousand dollars per annum to each State and Territory, for the maintenance of agricultural experiment stations. Of the fund for Connecticut, one half is, by act of its last Legislature, intrusted to the Board of Control of the State Experiment Station, and one half to the Board of Trustees of the Storrs Agricultural School. The managers of the station recognize that its purpose is both to investigate and to teach, that its duty is to select for study such questions as are of the most immediate and practical importance to the agriculture of the State, and that its work will be successful in proportion to the intimacy of its connection with the farmers whom it represents. But they feel bound to accept the lesson taught by years of experience, in this country and elsewhere, to which we have already frequently referred, that the most valuable results will be obtained by selecting a small number of questions for investigation, by making them narrow and specific, and by studying them with the greatest possible thoroughness. And they desire to avoid, so far as may be, the error into which so many stations, in their early experience, have fallen, in failing to recognize that often the questions which seem most theoretical are really most practical; that the highest, and in the long-run the most useful, work for agriculture is the discovery of the laws that underlie its practice; and that not infrequently the interests of the farmer require that theoretical questions be considered first, for the same reason that the foundation of the house is the first part to be built. In using part of its resources for abstract research, the managers of the station feel assured that it is doing its highest duty, and will have the heartiest support of its constituency.

#### INTELLIGENT CITIZENSHIP.

WE had occasion recently to refer to the growth of the Old South Work. This work has been carried on in various ways, — by lectures, by tracts, and by encouraging the writing of essays on appropriate subjects.

The 'Old South Leaflets,' which have been published during the last five years in connection with the annual courses of historical lectures at the Old South Meeting-House in Boston, have attracted so much attention, and proved of so much service, that the directors have determined upon the publication of this general series, with the needs of schools, colleges, private clubs and classes, especially in mind. The leaflets are prepared by Mr. Edwin D. Mead. They are largely reproductions of important original papers, accompanied by useful historical and bibliographical notes. The aim

is to bring them within easy reach of everybody. The Old South Work is a work for the education of the people, and especially the education of our young people, in American history and politics; and its promoters believe that few things can contribute better to this end than the wide circulation of such leaflets as those now proposed. It is hoped that professors in our colleges, and teachers everywhere, will welcome them for use in their classes, and that they may meet the needs of the societies of young men and women now happily being organized in so many places for historical and political studies.

Some idea of the character of this series may be gained from the following list of the subjects of the first thirteen numbers, which are now ready: No. 1. 'The Constitution of the United States;' 2. 'The Articles of Confederation;' 3. 'The Declaration of Independence;' 4. 'Washington's Farewell Address;' 5. 'Magna Charta;' 6. 'Vane's "Healing Question;"' 7. 'Charter of Massachusetts Bay, 1629;' 8. 'Fundamental Orders of Connecticut, 1638;' 9. 'Franklin's Plan of Union, 1754;' 10. 'Washington's Inaugurals;' 11. 'Lincoln's Inaugurals and Emancipation Proclamation;' 12. 'The Federalist, Nos. 1 and 2;' 13. 'The Ordinance of 1787.' A large proportion of these early numbers relate to the Constitution and the history of its growth, which are now subjects of special interest to historical students.

The excellence of the essays which have been presented during the last seven years, in competition for the Old South prizes, have induced the offer of prizes again the present year. The competition for these prizes, which could well be imitated in other towns, is open to all who have graduated from the Boston high schools (including the Latin schools) in 1887 and 1888.

The subjects for the essays are, 'England's Part in the Crusades, and the Influence of the Crusades upon the Development of English Liberty;' and 'The Political Thought of Sir Henry Vane. Consider Vane's Relations to Cromwell and his Influence upon America.'

Forty dollars will be awarded for the best essay on each of the subjects named, and twenty-five dollars for the second best, making, in all, four prizes.

The Old South lectures for young people for the summer of 1888 will begin Wednesday afternoon, Aug. 1. The general title of the course will be 'The Story of the Centuries,' the special subjects being as follows: 'The Great Schools after the Dark Ages;' 'Richard the Lion-Hearted and the Crusades;' 'The World which Dante knew;' 'The Morning-Star of the Reformation;' 'Copernicus and Columbus, or the New Heaven and the New Earth;' 'The Age of Queen Elizabeth;' 'The Puritans and the English Revolution;' 'Lafayette and the Two Revolutions which he saw.'

Many of those interested in the Old South Work are also interested in the Massachusetts Society for promoting Good Citizenship. In response to the question which is often asked, the society has issued a circular telling what is the object of this society, and what its members are expected to do. It is the intention of the promoters of the society that it shall encourage and assist every thing which tends to make men good and intelligent. The good citizen is, as they express it, before all else the good man. As De Tocqueville saw it to be in his time, so we see it to be in ours, the success of a republican-democratic government depends upon the moral and intellectual capacity of the community. We need intelligence, education, conscience, and health, and it is to promote these that the society is working.

The immediate and special inquiry as to the nature of good citizenship leads to the study of political history and political philosophy, and the society wishes to see a more serious and thorough study of what the world's great thinkers in the past have thought and said upon government and the state; and they would encourage a more careful study of our American history and institutions, our constitutions and laws, and this in comparison with those of other countries. The members of the society individually, or in association with each other in clubs or classes, are urged to these studies for themselves, and to promote and assist such studies on the part of others. The society would have its members study the town and the town-meeting, the city, the commonwealth, the nation, and international relations, believing that by such broad studies in the history of pol-

itics a true civic spirit is chiefly sustained, and that they are therefore the primary duties of the American citizen, and especially of those who desire to promote a more intelligent patriotism and a better public opinion.

As it has so often been urged, so does this society urge upon every good citizen his duty to give earnest attention to the political and social questions of the day, — such questions as, at the present time, protection or free trade, prohibition or license the relations of capital and labor, the limits of state control of industries, immigration, and international arbitration. The society urges that it is the good citizen's duty, which we presume no one will deny, to dispel ignorance and to spread knowledge of facts on these subjects, and to foster a large and worthy spirit in dealing with them. They further urge that it is the citizen's office to make knowledge powerful and controlling by attending punctiliously to his own duties as a voter.

The advantages of lyceums, debating-clubs, and lectures as means in developing an intelligent interest in political subjects are urged, and it is believed that members of the society can do much to sustain these. The society proposes further to aid the efforts of the members by publishing all the really useful matter that it can, in tracts, in pamphlets, and in the newspapers, and it has charged a competent committee with the preparation and recommendation of courses in reading and study. Another committee will give advice and assistance in procuring good lecturers. The larger the membership of this society, the wider will be its field of operation, and it is naturally desirable that there should be as many as possible who will give careful attention to the matter of local organization.

#### SCIENTIFIC NEWS IN WASHINGTON.

Stocking the Pacific Ocean with Lobsters; the First Successful Experiment in transporting Them Alive across the Continent; the Difficulties of Artificial Lobster-Propagation; Only One or Two Mature Lobsters from 12,000 or 15,000 Eggs. — A Curious Iroquois Mythologic Tale. — The Contour of the Atlantic Ocean's Bed; a Beautiful Model sent to Cincinnati by the Hydrographic Office.

##### Sending Live Lobsters to California.

THE United States Fish Commission shipped from Wood's Holl, June 16, 600 live lobsters and 250,000 lobster-eggs. Of the former, 350 arrived safely in Sacramento, Cal., June 22, and they have been deposited in the Pacific north and south of San Francisco. Several previous attempts to take live lobsters across the continent have failed. Of those sent only as far as Chicago, packed in seaweed in crates, only one in four survives.

Colonel McDonald, fish commissioner, personally superintended the packing of the lobsters lately sent to California. A crate or box devised by the late Captain Chester was used. This was placed within another larger box, the intervening space being filled with pounded ice. In the inner box the lobsters were placed between layers of rockweed, which at times was moistened with seawater. Each box had an independent drain, so that the fresh water from the melting ice could not enter the lobster-box. The temperature of the latter was kept at 45° F. A fish-commission car was used, the boxes along the side of it serving as the outer box of the combination described above; one hundred crates, each containing six lobsters, being placed in them, and surrounded with ice. Each morning before sunrise a careful inspection of the lobsters was made, and those that had died were removed. The first day 45 died; the second day, 55. After that the mortality was much less. All of those that died were in an advanced state of shedding, and were in poor condition when they started.

One-half of the 350 lobsters that arrived safely on the Pacific coast were placed in the ocean north of San Francisco, and the other half south. It is hoped that this experiment may demonstrate the feasibility of stocking the waters of the Pacific on the California coast north of Monterey with this delicious shell-fish. The condition of the water in that region is quite similar to that of the Atlantic off the Massachusetts coast. The temperature is about the same, except that it is more constant. The lobster on the Massachusetts coast crawls out into deep water in the summer, where the temperature is low, but it is thought that the equable

temperature of the Pacific will enable the lobster in those waters to spend the whole year in one spot.

Hatching-apparatus was taken to California with the 250,000 lobster-eggs shipped. The young lobsters produced by these eggs will be deposited in the sea at once. Although a fair trial will be made to determine the possibility of stocking the Pacific by artificial propagation, much more confidence of success is expressed by Colonel McDonald from the introduction of mature lobsters. The young lobsters have to be placed in the sea almost as soon as they are hatched, and begin to feed most voraciously, even devouring each other. For a few days they swim on the surface of the water, where they find food suited to their requirements, but where they also encounter millions of enemies. After their walking or crawling organs are developed, they sink to the bottom, which they then make their home. One of the problems which the United States Fish Commission is now attempting to solve is the invention of some method of keeping the little lobsters in confinement and safety after they are hatched, until they have attained sufficient strength and size to enable them to protect themselves. The importance of such an invention will be appreciated when it is known, that, from the 12,000 to 15,000 eggs produced by a female lobster in a year, not more than two lobsters, when left to nature, become full grown. Not only are almost all the little lobsters destroyed by their enemies, but a large proportion of the eggs are devoured by fish and seabirds before they are hatched. If, after artificially hatching the eggs, the Fish Commission could protect the young lobsters until they are large enough to take care of themselves, the supply of lobsters, which is now hardly equal to the demand, and would not one-half supply it if the price was reduced, might be increased almost indefinitely.

##### Iroquois Mythology.

The Bureau of Ethnology, in addition to the great variety of other work upon which it has been engaged, has almost from its first organization been collecting the quaint and curious stories prevalent among the Indians, translating and transcribing them, and arranging them for future comparison and study. Most of these stories are mythological; and it is one of the most curious and interesting facts, recently discovered, that the life of certain tribes of Indians is almost exclusively a religious one, far more so than that of the ancient Hebrews in any period of their history, and that the religious element is more intimately interwoven in the daily life of all the tribes than has heretofore been suspected. In the light of this discovery, the legends and mythologic tales that the Bureau of Ethnology has preserved, and to the stock of which almost daily additions are made, become of greater scientific value than ever before.

As an illustration of the character of some of these stories, the following obtained from the Iroquois, entitled 'Hinohawak and his Grandmother,' is interesting, first, because, although all the characters in it are personified, not one of them is a human being; and, second, because of the picturesque and graphically vivid style in which the story is told. 'Hinohawak,' translated, means 'the son of thunder.'

"There was a very poor old woman who lived in the woods. She was nothing but skin and bones. She lived in a smoky little house, and she cried all the time, both day and night. Her blanket was so old and dirty that no one could tell of what material it was. She had seven daughters. Six of these were carried off one after another by people. The seventh died.

"The daughter that died had been buried some time, when the old woman heard crying at the grave one night. She took a torch, went out, and found a naked baby. The child had crawled up out of the grave through a hole in the earth. The old woman wrapped the naked baby in her blanket and took it home. She didn't know her daughter was with child when she died. She did not suspect it.

"The infant, a little boy, grew very fast. When he was of good size, she came home one day from gathering wood, and could not find him. That night it stormed, thundered and rained. The child returned to her in the morning. His grandmother asked, 'Where have you been, my grandson?' — 'My grandmother,' said he, 'I have been with my father: he took me home.' — 'Who is your father?' — 'Hino ['Thunder'] is my father. He took me

home first, then we came back, and were all around here last night.' The old woman asked, 'Was my daughter in the grave your mother?'—'Yes,' said the boy, 'and Hino used to come and see my mother.'

"The old woman believed him; and as he grew he used to make a noise like thunder; and whenever Hino came into the neighborhood, he would go out and thunder, and help his father. He was Hinohoawak, son of Hino.

"After some time he asked his grandmother where his six aunts were, and his grandmother answered, 'There is an old woman, and her son Yeq-hdjiho-wa-wak, whose house is far away, and they live by playing dice and betting. Your aunts went one by one with a company of people, played, were beaten, and had their heads cut off. Many men and women have gone to the same place and lost their heads.' Hinohoawak said, 'I will go, too, and kill that woman and her son.' The old woman tried to keep him at home, but he would not stay with her. He told her to make two pairs of moccasins for him. He was very ragged and dirty, and she made the moccasins, and got him the skin of a flying squirrel for a pouch.

"He set off to the west, and soon he came to a great opening where there was a large bark house with a pole in front of it, and on the pole a skin robe. He saw boys playing ball in the opening, and went on a side-path and heard a great noise. By and by the people saw him, and one of them said, 'I don't know where that boy comes from.'

"The old people were betting, and the boys playing ball. Soon an old man came up to Hinohoawak and gave him a club; and he played so well that the old man came again and said, 'We want you to play dice: we will bet with you, all the people.' A bowl was placed on an elk-skin under the pole. The woman and her son were there, and the people were standing around.

"Hinohoawak answered, 'I don't know the game;' but the old man said, 'We will risk our heads on you.' So he followed the old man. He saw a white stone bowl as smooth as glass. The old woman was sitting there on the elk-skin ready to play, and Hinohoawak knelt right down by the bowl. She said, 'You play first.'—'No,' said he, 'you play first.' So she took the dice,—round ones, made out of peach-stones,—blew on them, and threw them into the bowl, which she shook. The dice flew up into the air, and all turned into crows, cawing as they went out of sight. After a while they came down, cawing, and turned back into peach-stones as they touched the bowl. The old woman was to play three times, and must get seventeen. She threw three times, but got nothing.

"Then Hinohoawak, to win, took dice out of his pouch of flying-squirrel skin. The old woman wanted him to use her dice, but he wouldn't touch them. He shook the bowl, and ducks flew up. They went very high, and all the people heard them as they rose. When they touched the bowl they were peach-stones again, and counted ten. Then Hinohoawak shook the bowl again, and called, 'Game! game!' but the old woman called out, 'No game!' Back they came and counted another ten. He tried the third time, and made ten more. He had won.

"Then he called the people to come and see him cut off the heads of the old woman and her son. 'No,' said the old woman, 'you must play again. Here is my son. You must play ball with him; and if he loses, we shall both forfeit our heads.' Then Hinohoawak asked the old man what he thought. The people, seeing how smart he was, said, 'Play;' and he went to the ball-ground ragged and poor-looking. There were but two playing, one on each side. Then Hinohoawak jumped, and knocked the club out of his antagonist's hand. Then Yage-hdji-ho-wak ran for his club, but before he could get it back, Hinohoawak had sent the ball through the barrier. This was repeated seven times, and Hinohoawak won the game. 'Now,' said he to all the people, 'you can have the heads of the old woman and her son.' The two heads were cut off, and the boys played with the old woman's head over the whole field. 'Now,' said Hinohoawak, 'I am going to bring my grandmother to this place, and we must all come here to stay, and have this long house to live in.' All went home to their houses; and as he went, he sang praises of himself, and his grandmother heard him on his way. He told her what he had done, and said, 'We must all go there and live in that nice house and feed.' She got provisions

ready, and they went. It took them a long time to reach the place. All the others came too, and built houses around in the field. When all the people had settled down, Hinohoawak went out and called them to the council-house to have a dance. After they had finished the dance, all went home.

"The grandmother put away her old blanket, and began to dress. She put on the clothes left by the old woman who lost her head, and soon she looked like a young woman, and they lived happily. After a while, Hinohoawak went off with Hino, his father, and staid all winter with him.

"In the spring the old woman was uneasy in mind. She heard thunder in the west, and pretty soon her grandson came to the house, and she was very glad to see him.

"'Where have you been?' she asked. 'At the great mountain far off in the west. I have been with my father, helping the nations and protecting men.'

"After that he staid at home all summer. Once in a while he would go away when it began to storm, but he came back again when the weather was good. He lived a long time in this way, till at last he said to his grandmother, 'I have an uncle living in the west. Some witch stole him from you. I must go and find him.' And so he went to the west to search for his uncle. He went on till he came to a house in which he saw a woman sitting by a fire, with her head on her hands. She wouldn't answer when he asked where his uncle was. By and by he went out, took the war-club from his pouch, knocked her on the head, and killed her.

"When he had killed the woman, he went out and walked all around the house, mourning, and looking for his uncle. He looked into the trees, but couldn't see any one; he looked upon the ground, but couldn't find him. By and by he came to a large slippery-elm tree, and the great roots held down a man. His head came out between two roots on one side, and his feet between two more on the other. The tree stood right on the middle of his body, and he was calling to his nephew to give him a smoke. And the nephew said, 'Oh, poor uncle! I'll give you a smoke pretty soon.'

"Then he kicked the tree over, saying, 'Rise up, uncle;' and the uncle rose up and was well. Then Hinohoawak took out his pouch and gave the old man a smoke. The uncle was very much pleased and strengthened. Then he told his nephew how the woman had beguiled him to go with her, pretending that she wanted to marry him; and when she had him at her house, she ate him up, and put his bones under the elm-tree. Then both went home to the long house. The old grandmother was surprised and glad. All lived happily there till one day when Hinohoawak went off in a storm. When the storm was over, he brought home a wife.

"When he went off after that with a storm, his wife was uneasy. She didn't know where he was. Hinohoawak had brought her such a long distance home on his back in the storm.

"After a time she had a son; and when the boy was large enough to run about, the old man, Hinohoawak's uncle, whose bones had lain under the elm-tree, began to teach him, and soon he was able to make a noise like thunder. One day the boy followed his mother out of the house. They had a little dog, and, as the boy was running after it, somebody seized him and rushed away; but the dog ran after him, managed to catch hold of his feet, pulled off his moccasins, and carried them home. This was the first indication the woman had that her boy was gone. Hinohoawak was off with a storm at the time, and when he came home his wife asked him if he had taken the boy. 'No,' said he. 'Oh, he is lost!' cried she. 'Oh, no! he is all right,' said Hinohoawak. 'He has many relations around the world, uncles and cousins.'

"The boy staid away all winter.

"When the winter was over, he came home one day with his father. Then Hinohoawak said to the people of his family, 'We must all move away and live with my father.' The old woman said, 'No, we cannot go, it is so far, and I am so old.'—'I'll carry you there in a little while,' said the grandson. Then Hinohoawak began to thunder, and lightning flew around. The house was torn to pieces, and blazed up in flames. All the rocks and houses in the opening were broken to bits. Hinohoawak and all of his people rose up in the air. The east wind began to blow and carry them

to the Rocky Mountains, where they found old Hino. All live there in the caves of the rocks."

#### Models of the Ocean's Bed.

The Hydrographic Office has sent to the Cincinnati exhibition a collection of charts, photographs, etc., illustrating the work of the office and the modes of doing it. These will be interesting to scientific men, teachers and students, but, except the photographs, are not likely to arrest the attention of the average visitor. But there are two plaster-of-Paris models in the collection that are certain to be examined with curiosity, and studied with profit, by every one who stops to look at them. They are models of the bed of the Atlantic Ocean and of that of the Caribbean Sea. These have been made by Mr. E. E. Court, of the Hydrographic Office, and the charts from which they were constructed have been carefully revised by Commander J. R. Bartlett and Lieut. J. L. Dyer, respectively former and present hydrographer.

Each of these models shows the contour of the bottom of the sea, that of the Atlantic embracing the whole ocean from latitude  $60^{\circ}$  north to latitude  $40^{\circ}$  south, or from Greenland in the north to the unknown region in the south, and includes the Mediterranean Sea on the east, and the Caribbean Sea and a part of the Gulf of Mexico on the west. The chart from which the necessary data were plotted in order to make the model was compiled on a very large scale from the charts of the United States and all foreign hydrographic offices, the very latest deep-sea soundings having been utilized. The contour-lines are drawn according to these soundings. This chart, while it tells the whole story to the experienced hydrographer, — the figures with which it is covered possibly conveying to his mind a picture of how the bed of the Atlantic would look if spread out before him so that he could get a bird's-eye view of it, — is entirely meaningless to the great mass of people. But in the model that is constructed from the chart every depression of the ocean is represented by a corresponding depression in the plaster-of-Paris; so that even a child, with a few words of explanation, can obtain from it a clearer, more vivid, and more correct idea of how the bed of the ocean looks than the man of science could obtain from a chart.

The horizontal scale of the chart and model is sixty nautical miles, or one degree of longitude, on the equator, to each six-tenths of an inch; and the vertical scale is fifty times as great as the horizontal.

The original model was made of wooden boards, one-eighth of an inch thick, each layer representing 250 fathoms of actual depth of the sea. The intermediate soundings are also very carefully represented by carvings of the boards. When the entire contour had been fully represented in the wooden model, a plaster-of-Paris cast was made from it, and this was carefully painted so as to represent in their actual colors, as shown by deep-sea soundings, the mud at the bottom of the sea. As the depth increases each thousand fathoms, the shade becomes darker and darker, the darkest being in the deepest place known, — 4,561 fathoms, or about 5.2 statute miles.

There are many things shown by this model that will be surprising to almost everybody except the expert hydrographer. One of these is the great height of many of the small islands from the ocean's bed, when compared with their area either above the surface of the water or where they rest upon the bottom of the sea. Of course, this height is exaggerated in the model by making the perpendicular scale fifty times as great as the horizontal scale; but, even allowing for that, these islands stand up like tall, narrow, truncated cones, many of them not being more than twice as far across at the base as at the top.

The model of the bed of the Caribbean Sea was designed by Commander J. R. Bartlett, and the chart was compiled from deep-sea surveys made by himself and by Lieut.-Commanders W. H. Brownson and Z. L. Tanner. The latest soundings are embodied in it. In this model, of which the horizontal scale is thirty-three miles to an inch and the vertical thirty-three times the horizontal, the topography of the land is given in the same proportion as the depths of the sea.

Duplicates, or even photographs, of these models would be of very great value in the teaching of physical geography. That of

the bottom of the Atlantic Ocean would give a pupil more actual instruction in a quarter of an hour than a week's study of descriptive text.

#### ELECTRICAL SCIENCE.

##### Continuous and Alternating Currents.

IN the last few months discussions have taken place, both in England and this country, as to the relative value of continuous and alternating currents for the distribution of electrical energy. In England the employment of storage-batteries with the continuous current has been advocated: here the simple direct system has been pitted against the alternating. We have noticed these discussions from time to time: now that they are finished, it will be well to sum up the results.

The alternating system, employing induction-coils or transformers, has the advantage of allowing the current to be distributed at a high potential to the points of consumption, and therefore it requires distributing-wires of comparatively small section. There seems little doubt, as matters now stand, that it is best for scattered towns, or even in cities if the lighting is mainly confined to theatres, clubs, stores, etc., which are at a considerable distance apart, and which are to be supplied from a central station. When it comes to domestic lighting, however, where we wish to supply entire districts in cities with electric lights instead of gas, the case is different. Let us consider the availability of the three systems — alternating, direct, and direct with storage — for this purpose. The practice with the alternating system at present is to have a transformer for each house to which lights are supplied. When a large number of houses are to be supplied in a city district, this plan cannot be economically carried out, especially if the wires are forced under ground. The insulation of such a complicated network of high-potential wires would be difficult and expensive, — almost impracticable, in fact. Again: as each house would have a transformer whose capacity would be the maximum number of lights that would be used, and as the average number of lights is only a small fraction of the maximum, the transformers — which are not economical when their load is small — would have a low average efficiency. If the alternating system is to be introduced into cities to seriously displace gas, it must be on some such plan as Mr. Kapp proposes. Large converters are placed at different points in the district to be lighted, and the current is distributed at low potential from these. It will be found, if this is done, that the saving in wire is not so large as might be expected, for the greatest expense will be in the low-potential distributing-mains.

The only storage-battery system in extended practical use is that employed by Mr. Crompton. A number of sets of cells are distributed in sub-stations through the district to be lighted, the different sets are connected in series, and the lamp-circuits are taken from the terminals of each set of cells. The batteries act then partly as a converter, allowing high-tension currents for distribution, with a comparatively small difference of potential at points of consumption. Another advantage lies in the fact that the cells can be charged when the demand is light, and discharged at the time of maximum demand, thus allowing a smaller generating-plant. Mr. Crompton claims a high efficiency for the arrangement, and he is no doubt right. There is a loss, of course, in the part of the energy stored, but very little in that converted; and, as the former is not a large part of the total output, an efficiency of eighty-five per cent is not improbable. Mr. Crompton also claims that the repairs of the battery will not amount to more than ten per cent of their cost. The disadvantage of this system lies in the fact, that, with batteries in the circuit, insulation is difficult; and while the difference of potential between the leads taken from the two ends of a set of cells is only, say, one hundred volts, yet the difference of potential between these and the ground depends on the position of the set, and might be high. In fact, we have the disadvantage of distributing at a comparatively high absolute potential, with all the difficulty of insulation that it entails.

The simple direct system has the advantages of a high efficiency and simplicity, and it is economical within a limited area of distribution. It has the disadvantages that the station must be located near the centre of the district to be illuminated, and the area of operation is restricted.

When it comes to supplying an entire city with light, and the question of the relative cost of the various systems is considered, it will probably be found that the most economical will be not any one of the systems, but all of them, — two or three stations in the city proper for the direct and storage systems, the latter for localities distant from the central stations. For the suburbs the alternating system could be used, the stations supplying the alternating currents also supplying arc lights.

It should be noticed that in the discussion in England before the Society of Telegraph Engineers and Electricians, Mr. Kapp, who championed the alternating-current side of the question, admitted that a system of distribution by storage-batteries was the ideal system, but he said that he knew of no reliable storage-batteries. Mr. Crompton's system is not a complete storage system: as has been pointed out, he uses the secondary batteries more for converters than for their storage properties. In a complete storage system the batteries should be so arranged that the full capacity of the station is utilized, so that the engines and dynamos are giving their maximum output the whole twenty-four hours. To do this with safety, there should be two sets of cells, one being charged while the other is discharging. There can be no question that storage-batteries have been greatly improved in the last few years, there is no question about the possibility of future improvement: so we may look for developments in this direction.

If the discussions have shown any thing, they have shown that the direct system is the best for crowded centres, the alternating for scattered towns and suburbs, while Mr. Crompton's storage system could be used to at least double the area of economical distribution from a direct-current station.

**ELECTRIFICATION OF METAL PLATES BY IRRADIATION WITH ELECTRIC LIGHT.** — The influence of light on electric phenomena, which has attracted so much attention in the last year, is being made the subject of numerous researches. Mr. Hallwachs describes some interesting experiments that he has lately carried out. A metal plate was suspended inside of an iron cylinder whose axis was horizontal. The plate was five centimetres in diameter. The cylinder was fifty centimetres long by thirty-seven centimetres in diameter. The surface of the plate was coated with rust except in one spot, where it was brightly polished. It was first connected with the earth. The wire by which it was suspended passed through, but insulated from, an earth-connected brass tube, to an electrometer. In one end of the iron cylinder was a circular aperture eight centimetres in diameter, covered with wire gauze to prevent any inductive influence of the electric lamp used on the plate. The cylinder was electro-negative to the case, so that any transport of electricity by radiation — a phenomenon described by M. Righi — would have charged the plate negatively. If, now, a plate of mica was placed in the aperture in the cylinder, and the plate illuminated by an electric light, there was no indication on the electrometer. If, however, the plate of mica was replaced by a much thicker plate of selenite, the electrometer gave a gradually increasing deflection, indicating positive electricity. This at once ceased when the selenite was replaced by mica. The rise of potential cannot, therefore, be due to an inductive action, nor can it be referred to the action of heat. The metals which were used for the experiments just described were zinc, brass, and aluminium. In all three, positive electricity occurred on irradiation with brightly polished surfaces. Old surfaces no longer showed the phenomenon. The radiation itself lowers the potential to which the plates can be electrified; so that with any succeeding experiment made with the same surface the potential obtained is lower, while the rise to it takes place more rapidly. The maximum potential with zinc amounted to over a volt, with brass to about one volt, and with aluminium to five-tenths of a volt.

**ELECTRIC-LIGHTING IN MINES.** — For some years past efforts have been made to introduce electric lights in mines, and rewards have been offered in England for the invention of some safe, reliable, and economical system of lighting. The difficulties to be contended with are these: For permanent lights there is trouble in insulating the leads in such a way as to prevent possibility of breaks or grounds, the demand on the insulation being particularly trying, while there is danger that the breaking of the lamps

will explode any inflammable gases around them. For miners' lights, the greatest trouble is to get a portable battery that can be easily carried, and which is cheap and simple. In this country no advance has been made in the application of electricity to mine-lighting; but in England much attention has been directed to it, and electric miners' lamps are being extensively introduced. In the National Colliery, Rhondda Valley, no less than eight hundred such lamps are used, while they are being introduced into other mines controlled by the same company. These are on the Swan system. At Cannock Chase the Pitkin system is employed; at Aldwarke, the Sun system. With the excellent primary batteries that have been lately brought out, and with the improvements that have been introduced in miners' lamps, it is probable that they will soon be largely used in mining-work.

#### BOOK-REVIEWS.

*Proceedings of the Society for Psychical Research.* Part XII. June, 1888. London, Soc. Psych. Research.

THIS number of the Proceedings deals almost exclusively with a class of facts towards which it is becoming more and more difficult for the man of science to assume a fitting attitude. The men who vouch for the correctness of the facts are in part drawn from their confrères, eminent in other branches of science. They are apparently on their guard against some, at least, of the many and various forms of deception. They, with some exceptions, set forth their results with much candor, and without conscious bias. And yet one reads their writings with the conviction, that grows as one reads, that all this is premature, that these men do not give evidence of that same comprehensiveness and scientific reserve which they would exhibit in case of a problem touching upon their own specialty. One feels the absence of a sound psychologic insight, such as comes only from years of special training, and the experience of a life dominated by a powerful interest for this kind of phenomena. One longs for the counterpart of such a man as Robert-Houdin, training every sense to its maximum of sensitiveness, and every muscle to the utmost expertness, in order to be a master in the art of deception. In the goings-on of his daily life he is constantly on the alert for some chance combination of events that suggest a new mode of misleading the spectators of his conjuring. Again, the length of the articles; the large proportion of theorizing; the lack of constant reference to the results of others, especially of those not in harmony with their own views, — all this, not to mention occasional serious faults in logic and sad deficiencies in the stringency of the observations, will far postpone the day when these Proceedings will be found on the shelves of a strictly scientific library.

The English Society for Psychical Research, it need scarcely be said, has definitely accepted the hypothesis of telepathy, — of the action of mind upon mind apart from the recognized channels of sense. They accept this not merely as the only satisfactory principle by which their facts can be accounted for, but they are ready to use the theory as a means of explaining other groups of facts. All of the four main contributions to the present number deal with facts of telepathy, and largely with the relation of this power to hypnotism. M. Charles Richet takes up one hundred and fifty pages with an account of a very elaborate and extended series of observations of such transference. This paper is to be ranked as among the most serious evidence that has yet been presented, and will be noticed in a future number of *Science*. Messrs. Schmoll and Mabire describe very similar experiments, but conducted with far less caution and insight. Failures are overlooked as unimportant. Just at the point where one desires most accurate information, the account is vague. The percipient is allowed too many trials, is too clearly informed of his success. The series in which the conditions were most convincing "produced only failures." The repeated statement of the percipient after seeing the object he was to think of, that at first this had come to his mind but was rejected, is recorded with great *naïveté*. Such illusory instructions as that the agents must entertain no "secret hope of failure" are seriously recorded. All this renders these observations of little weight.



Mr. Gurney contributes two articles. In the first he describes some curious experiments in hypnotism, in which the subject is given an hypnotic suggestion to write such and such a word, and when awakened is utterly unable to recall the word, not even by an offer of money; but when seated at the planchette he unconsciously, or, as Mr. Gurney prefers, automatically, writes the word without knowing what he has written. The variations on this experiment are more curious than valuable; but the cardinal idea is a happy one, and promises to shed new light on the rôle of memory in hypnotic states. Many of the author's deductions from and explanations of his phenomena will not be indorsed by authorities in hypnotism. In his second article Mr. Gurney argues at great length for the admission of two kinds of suggestion in hypnotism, — the first the recognized physical suggestion; and the second a purely psychical suggestion, acting without contact and at a distance. He traces the relations and analogies of the one to the other, and marks off the boundary-lines of the two. All of this is decidedly premature, but it serves a useful purpose in singling out the very point upon which further study should and will be directed. Can the increased sensibility, the astounding subtlety, and the marvellous shrewdness of hysterical hypnotics account for the observed phenomena, taking into account the difficulties of a complete observation and our ignorance of the possibilities of deception, or must we introduce an agency new to the domain of science? Quite relevant in this connection is the footnote of Mr. Gurney's, pointing out that hypnotic subjects easily establish a fashion, and that here is the clew to the differences between the schools of Paris and of Nancy; and it may be added, that an omission of a factor such as this would make a telepathic fact of what, under this view, is only a shrewd and largely unconscious acting-out of a suggestion.

Among the critical notices, Mr. F. W. H. Myers writes a very matter-of-fact account of the work of the Seybert Commission, and describes some observations of Professor Foutan on seeing with the fingers, and hearing with the fingers, the chief feature of which is their incredibility. Mr. Myers overestimates their value, and they must be corroborated before they can rank as facts at all.

What in many ways is the most important and interesting contribution in the number is to be found on the last two pages. Here we are told that the Creery girls, from whom experimental evidence of telepathy had been gained, were detected in the use of a code of signals. They had both a visual and an ordinary code; and, though these codes may not have been used on all occasions, it throws discredit on all results obtained through their agency. If scientific observers can thus be deceived by young girls, — inexperienced, and apparently perfectly sincere girls, — ought not this to impress upon every investigator the profound importance of acquainting himself with the possibilities of deception, and perhaps to conduct his observations on the principle of the detective who held every one to be criminally inclined until proven to be honest?

*Looking Backward.* By EDWARD BELLAMY. Boston, Ticknor. 16°. 50 cents.

THE preface to this work is dated in the year 2000, and its object is to show the state of society which in the author's opinion is destined to prevail at that time. The author, being a novelist, has written the work in the form of a story, the principal actor in which, Mr. West, tells his own tale. He goes into a trance in the year 1887, and awakens in the year 2000, when he finds himself in a society so different from that he had been accustomed to, that it took him some time to get acquainted with it. This society is based on State socialism in the most extreme form. All industry is controlled by the national authorities at Washington, the individual States as well as all private corporations and capitalists being done away with. The authorities are almost exclusively occupied with managing the national industry, but little legislation being needed; for the people are all so very good, that they have no disposition to wrong each other, the few cases of crime that occur being regarded as examples of 'atavism.'

This amazing moral improvement, our readers will understand, is entirely due to the equal distribution of property. Every individual has an equal share with every other in the national industry, so that there is no check on the increase of population. On the other hand, every one is required to work according to his abilities; yet

the men of the new era are represented as loving each other so very much that they are perfectly satisfied with this arrangement. Moreover, the wealth of the world is so enormously increased, that everybody lives as luxuriously as the richest folks do now. In short, the book depicts the usual socialistic Utopia, with many refinements of detail.

The absurdity of the whole thing is evident from various considerations. Besides the difficulty of managing such a colossal industrial system in the way supposed, — a difficulty which the author of the book fails entirely to appreciate, — the social order here exhibited assumes such an increase of wealth as could not possibly take place without mechanical or other inventions such as have not yet been even dreamed of, and which Mr. Bellamy does not even hint at. For, not only are all men to be rich under the coming régime, but they are not to work more than five or six hours a day, and are to cease work entirely at the age of forty-five. The idea advanced by the author, that such a vast increase in the production of wealth will result from a mere change in the mode of distribution, is preposterous.

Again: Mr. Bellamy's scheme assumes the possibility of a moral improvement such as cannot be made in less than some thousands of years, if indeed it ever can be. The theory that all wickedness and crime are due to the unequal distribution of wealth is contradicted by every man's personal consciousness and of all that we know of human nature. It should be added, that Mr. Bellamy's ideal of human happiness is any thing but a high one, for it consists mainly in 'easy and agreeable relaxation;' and he expressly says that 'bread and games' are the prime necessities of life. In short, the book describes a state of society and of human life that is not only impossible, but in many respects as undesirable as it is impossible.

*Memory and its Doctors.* By Dr. E. PICK. London, Trübner. 12°.

*Memory: What it is, and How to improve it.* By DAVID KAY. London, Kegan Paul, Trench, & Co. 8°.

*"Loisette" exposed, together with Loisette's Complete System of Physiological Memory.* By G. S. FELLOWS. New York, The Author. 8°. 25 cents.

ALTHOUGH the search for the philosopher's stone has been abandoned, and men have come to agree that there is no royal road to knowledge, still one can often detect in many a mind a lurking fondness for the belief that there may possibly be some undiscovered short cut to mental attainment which a modern Raymond Lully or Ponce de Leon may reveal in a few lessons under the inspiration of a proper fee. It seems not a rash assumption to make, that, of the many thousands who within a few years have paid tribute to a certain 'American memory professor,' not a few came with the secret hope of emerging from the five lessons with their entire mental furniture put into perfect order and vastly improved. While these people lend a willing ear to the physiologist when he explains to them how mental acquisition is related to organic growth; how everywhere normal growth is a gradual, assimilative, and digestive process, not to be hurried by overdosing and cram; yet they have not the necessary faith to apply this knowledge to the particular case in which they are interested. This, together with a successful advertising machinery and production of testimonials, must largely account for the phenomenal success that has attended this professor of memory.

Remarkable memories have from ancient times attracted a good deal of attention. Especial attention seems to have been given to the subject of artificial memory throughout the sixteenth, seventeenth, and eighteenth centuries. Dr. Pick gives a convenient sketch of the history of the topic. Petrus de Ravenna is said to have played a game of chess, and to have dictated two letters on stated topics at the same time that dice were thrown and the throws recorded. When the game was over, he recited all the moves of the game of chess, all the words of the two letters backwards, and each throw of the dice in order. System after system of mnemonics was proposed, each promising more than its predecessor, and all painfully artificial. The association of dates and items to be remembered visually with the compartments of an imaginary house, or orally with the names of the letters, with numbers and harsh com-

binations of meaningless sounds, of which the 'Barbara, celarent, etc., is a typical survival; the translation of letters into numbers and associations formed on ridiculous principles, seasoned with wretched puns, — all these flourished, and had their day. One doctor even invented a pill that would improve the memory; while another announced with great *déclat* that the seat of the memory is the occiput, and that roasted fowl, small birds, and other delicious things, acted favorably on this organ. Even the pledging of the pupils to secrecy is not a new invention. These systems have been well likened to the keys, with enormous brass stars attached, that one gets on steamboats. The object of the appendage is to prevent one from forgetting to leave the key behind, but the encumbrance one has to carry to secure this end is a greater annoyance than the task of remembering to return the key.

Only in very recent times has the scientific study of memory as a psychic function been seriously undertaken, and the subject been popularly treated in a sound manner. The name of Dr. Pick deserves to be mentioned as among those who first broke away from utterly artificial systems, and, while modestly claiming the success of his teaching, presented the topic on a natural basis. His present volume is mainly a reprint of former lectures, with a history of mnemonics, and a series of testimonials of the success of his teaching. It seems to have been brought out by the unjust use of his work by Loiset.

Dr. Kay's work has many points that deserve high commendation. "The author has little faith in arts for improving the memory in two or three lessons, but he has unbounded faith in systems of education, properly conducted, to effect incredible improvements in this direction." Accordingly he approaches the problem from a broad psychological point of view, with no haste to suggest startling practical results. A very small portion of the book is devoted to a study of what is currently understood as memory. The main object is to show the position of memory in the hierarchy of mental powers, and set forth the modern doctrine of its physiological concomitants. An entire chapter is devoted to the relation of body and mind; an equally full description of the senses and their mode of acquiring information is given; the nature of mental images, and the rôle of the unconscious, are similarly treated. We are then prepared to consider the special processes upon which a good memory depends. First and foremost is close and accurate attention to the impression at its first appearance. The attention must be trained, and sense-perception made quick and accurate, if memory is to be retentive. Not less important is the association of our knowledge by natural links, and along the lines of our own interests. It is only by such means that a serviceable memory can be developed, if by memory we mean, not the power of performing a few striking mental gymnastics, but the power of having our knowledge ready to hand, and carrying it with little effort. That this problem changes its character with each individual, goes without saying. Mr. Kay's book is full, in fact over-full, of citations from various authorities, and is an admirable book to put in the hands of an intending student of the subject. It is a pity that his physiology is sometimes at fault, that his authorities are at times promiscuously chosen, and especially that he has not taken advantage of the most recent technical studies of the memory, of which the work of Dr. Ebbinghaus is so excellent a type. These seem to be omitted because they are in a foreign tongue. From the liberal use that Mr. Kay makes of translated works, one can infer how much his book would have increased in value had he gone to the originals.

The last volume on our list has little claim to serious consideration, were it not for the practical service that a knowledge of its purpose may render. Mr. Fellows here prints the whole of Loiset's lesson-papers, urging that they have not been copyrighted, and that his signature to a pledge of secrecy was secured on false pretences. He furthermore gives evidence that casts a serious doubt upon the honesty of Loiset's career. The system itself is certainly a most wonderful combination of the endless repetition of a few cant expressions; of persistent reference to the originality and excellence of the Loisetian method, duly emphasized by Italics and bold type; of most careful prescriptions against breathing an atom of this sacred information; and of a general unacknowledged selection from previous writers on the topic. A sentence will proba-

bly suffice to illustrate the tone of the teaching: "My Discovery, so far as it pertains to this Lesson, demonstrated *what had never been suspected by any one before*, — that all memories — the strongest as well as the weakest — are PRODIGIOUSLY STRENGTHENED in both Stages by learning and reciting forwards and backwards, or, what is better still, by *making and repeating* from memory both ways a series of from 100 to 500 words arranged in conformity to the three Laws given below, which Laws were revealed to me, on their Physiological, or only true side, by my Discovery." It is certainly surprising that this 'system' should have met with the success it had; and it is hoped that its publication in this form will not only prevent the swelling of the list of the victimized, but will warn all against any one who advertises a royal road to any mental acquisition the gate of which is opened only by a fee and a pledge of secrecy.

*The Animal Life on Our Sea-Shore.* By ANGELO HEILPRIN. Philadelphia, Lippincott. 12°. 50 cents.

THIS is a handbook on the local fauna of Philadelphia and of the much-frequented New Jersey and south Long Island coasts, which will certainly prove extremely interesting to all who care to know something of the animal forms they may see during their summer vacations. The book may be relied upon as being thoroughly accurate; but it is in no way hard reading for the unscientific, and tells them just what they want to know, which is what they may see by the seashore, and where to see it, at the same time giving in each case the life-history of any specimen they may procure. We already have Emerton's 'Life on the Seashore,' designed for the New England coast, and this little book covers another region largely frequented during the summer season. It treats of the shell-fish, the jelly-fish, the star-fish, the worms and sponges, and some coastwise fishes.

#### NOTES AND NEWS.

THE letters in recent numbers of *Science* describing a peculiar form of northern lights serve to call to the mind of the editor of the *Progressive Age* a sight that he witnessed in August of last year when on board the steamship 'Ozama,' passing along the north-east coast of the island of Santo Domingo, and near to the northern entrance to Mona Passage which connects, between the islands of Porto Rico on the east, and Santo Domingo on the west, the Atlantic Ocean on the north, and the Caribbean Sea on the south. "We were southward bound, and the hour was about nine o'clock at night. The moon was at its full, or thereabouts, and very bright, as is the case in the tropics, especially in the summer season. The sky was entirely clear at the time, with the exception of a small cloud forward of the ship some distance, but between the moon and the coast, which is low and flat for many miles at that part. Suddenly a sharp shower of rain commenced to fall from the cloud, and immediately there appeared over the land, apparently close to the edge of the coast, the most perfect and beautiful rainbow it has ever been the pleasure of the writer to see. Everybody but the writer and the captain, who was on the bridge, were below at the time. The latter said it was the first occurrence of the kind that had come under his observation. That was certainly the case with me."

— The number of words in a person's vocabulary has been frequently and variously estimated. The old philologists thought that few persons used more than ten thousand words, while the ordinary unlettered man possessed from three thousand to four thousand words. It is well known that Shakspeare's vocabulary includes fifteen thousand words, and Milton's eight thousand words. A Swiss writer, M. Edmont de Beaumont, has recently made estimates far in advance of these. He maintains that rustics have at their command as many as seven thousand words; artisans, ten thousand; tradesmen, fifteen thousand; men of culture, twenty thousand; and university graduates, twenty-five thousand. The minimum number of words "without which one makes a pitiful figure in a conversation among cultivated persons is ten thousand." M. Beaumont himself claims to have the use of twenty thousand words in several languages.



— An entirely new machine has been invented for printing postal-cards from the roll, and to turn them out packed in bundles of twenty-five. It prints the cards at the rate of three hundred a minute in the usual way, by means of a rotary press. A set of knives then cuts the cards off, and drops them four abreast into little cells especially prepared for them. When twenty-five cards have dropped out, a set of steel fingers turns the pack over, twines a paper band about it, and pastes it together. The packages are caught in an endless belt of buckets, which carry them into an adjoining room, where they are received by girls, who place them in boxes ready for delivery. One man can look after two machines.

— According to the *Engineering Journal*, the new Argentine-Pacific Railroad from Buenos Ayres to the foot of the Andes has on it what is probably the longest tangent in the world. This is 340 kilometres (211 miles) without a curve. It is also a remarkable fact that in this distance there is not a single bridge, and no opening larger than an ordinary culvert. The level nature of the country will be appreciated from the statement of the further fact that on the 340 kilometres there is no cut greater than one metre in depth, and no fill of a height exceeding one metre. The country, in fact, seems to be almost an ideal one for railroad-construction. There are some drawbacks, however, one being that there is almost an entire absence of wood on the plain across which the western end of the road is located. This has led to the extensive use of metallic ties, which will be used on nearly the entire road. Work has already been begun on the mountain section of the road, which is to cross the Andes and unite with the Chilian line.

— The *Engineering Journal* comments on the contest between armor-plates and projectiles, which has been renewed abroad. Some recent experiments with steel and composite plates made in England seem to indicate that for the present the projectiles have the worst of it. On the other hand, it is announced that the Krupp Company is now building at Essen the largest gun yet made: it is for the Italian armor-clad 'Sardegna,' and will weigh 139 tons, will be 52½ feet long, and have a bore of 15.7 inches. This gun will, it is stated, fire a steel shell weighing 1,630 pounds, with an initial velocity of 2,630 feet per second, or a heavier shell of 2,300 pounds, with an initial velocity of 2,100 feet. It is expected by the makers that this projectile will be able to knock out of time any armor-plate now afloat, and that there will then devolve upon the other side the problem of building a vessel which can float armor-plates heavy enough to resist these shells.

— From statistics based on the census of 1886, it appears, that, of the 51,600 families applying to the authorities for aid in Paris, 2,739 were foreign, comprising more than 7,000 persons. Of 100 heads of families of foreign origin, 27.31 were German; the English only figured in these statistics for 0.95; the Austrians, for 1.79; the Spanish, for 1.06; the Dutch, for 6.97; the Italians, for 7.12; the Russians, for 3.36; the Swiss, for 5.44; the Roumanians, Servians, and Bulgarians, for 1.31. Of 1,000 foreigners living in Paris, 253 were Belgians; 168, Germans; 71, English; 29, Austrians; 21 Spanish; 91, Dutch; 125, Italians; 42, Russians; 132, Swiss.

— On the 20th of June last, M. H. Lecoq, accompanied by an aeronaut, ascended, at quarter-past seven in the morning, from Paris, in a balloon of 700 cubic metres capacity. The balloon quickly reached a height of 600 metres, and moved towards the south-east. The sun appeared as a bright red disk, and it lighted Paris with a yellowish light, producing a most singular effect. After having crossed the Seine above the Isle of St. Louis, about half-past eight M. Lecoq saw that the thunder-cloud which had commenced to form when they started was approaching rapidly, and it was not long before they heard the thunder. Immediately the balloon, influenced by the electric attraction, rose towards the cloud, accompanied, or rather preceded, by the pieces of paper which the balloonists had thrown from their basket. At twenty minutes of eight, and at a height of 1,100 metres, the balloon entered a cloud-mass of a greenish-gray color, which immediately shut out from them all sight of the earth. Even the guide-rope could not be seen for more than a few metres. The cloud was illuminated by intermittent flashes, immediately followed by short peals of thunder. The balloon constantly rotated, and ascended

and descended, without the interference of the balloonists; and, what is a rare thing in a balloon, they felt almost constantly a very considerable wind, which shook the balloon, and gave to the basket a swinging motion of considerable amplitude. Soon the storm broke with its full force, and the lightning was followed immediately by the thunder. M. Lecoq states that neither he nor his companion felt any ill effects further than the oppression which is always experienced in an atmosphere highly charged with electricity. On the ropes of the balloon he observed some manifestations of St. Elmo's fire. At certain times a sensation as of a current of cold air was very perceptible. This was followed immediately by a rapid ascension, and the expelled gas descended even to the basket. During one of these ascents the balloon reached a height of 1,600 metres, which was the maximum. At this height the storm was at its greatest force. The discharges of lightning took place between a cumulus-cloud, in which floated the balloon, and the cirrus-cloud above. The ascension was especially interesting on account of the long time during which the balloon staid in the thunder-cloud, — a circumstance which rarely occurs. M. Lecoq was specially impressed by the violent movements of the air, and by the rapid ascents and descents which took place in the middle of the electrified cumulus, as if due to a powerful attraction which affected the balloon and light bodies floating in the air.

— The total number of European troops in English India in 1886 was 61,015, and the average death-rate per thousand was 15.18; in the province of Bengal there were 39,000 men, and the death-rate was 15.5; in the province of Madras, 11,000, and the death-rate 16.2; province of Bombay, 11,000, death-rate 12.7. The number of native troops was 106,010, and the death-rate was 19.46 per thousand.

— Some eighteen months ago the French Senate passed a law providing for civil or religious funerals, and for burial or cremation, according to the desires of the parties interested; but as yet the administrative authorities have not determined on the conditions to be observed in the different modes of disposing of a body, and as yet Paris is without a proper crematory. Early in the year a commission was sent to Milan and Zurich to investigate the crematories in use in those cities. This commission reports that the Italians are not better off in Milan than the French in Père Lachaise. Cremation at Milan lasts two hours; at Paris it lasts an hour and a half, with an expense of from fifteen to twenty francs. The commission estimates that the time is too long, but that the expense cannot be reduced. They hope to be able in a few months to effect a cremation in from one-half to three-quarters of an hour at the outside. In this connection, it may be mentioned that there exists in Paris a society for the advancement of cremation, numbering at present six hundred members. It seeks by all legal means to assure every person who desires it that his body shall be cremated after death. Membership does not imply any engagement to accept this method, but leaves complete liberty of choice.

— Late research in this country and in Europe implies that some plants have the power of getting nitrogen from the air. How they obtain it, how much is gathered by the foliage, and how much comes through the soil and the roots of the plants, are things to be found out. If there are plants that can draw this scarcest and costliest of all the elements of plant-food from the air, it is important to know what plants they are, and the circumstances under which they get it. If the nitrogen must first be introduced into the soil by natural processes or by manuring, we need to know how this can be done most economically. How much nitrogen plants can obtain from the atmosphere, is a problem best studied by experiments on a small scale in the greenhouse and laboratory. For the investigation of this latter question, which has a high scientific as well as practical importance, Storrs School Agricultural Experiment Station at Mansfield, Conn., has begun a series of experiments in pots by the method of sand-and-water culture. Late research implies that the minute organisms called microbes or bacteria may have something to do with the acquisition of atmospheric nitrogen. This especial problem is being studied in connection with the experiments on nitrogen-supply under the immediate supervision of the director, Prof. W. O. Atwater.

— *Nature* states that the vapor-density of sulphur has been determined by Dr. Biltz in the laboratory of Prof. Victor Meyer with unexpected results. It has hitherto been generally accepted that at a temperature ( $524^{\circ}$  C.) not very far removed from its boiling-point ( $447^{\circ}$  C.) the molecule of sulphur is built up of six atoms. This assumption is based upon vapor-density determinations by Dumas and Mitscherlich, who obtained values about this temperature pointing to a hexatomic molecule. However, the work of the last few years upon the chlorides of aluminium, tin, and iron, has opened the eyes of chemists to the fact that the double formulæ  $\text{Al}_2\text{Cl}_6$ ,  $\text{Sn}_2\text{Cl}_4$ , and  $\text{Fe}_2\text{Cl}_6$ , resting as they did upon a few experiments performed within a very limited range of temperature, are erroneous, and have no foundation in fact. The older work upon the constitution of sulphur molecules was notably of this class. The experiments themselves were irreproachable, and completed with all the skill for which the experimenters were famous; but unfortunately the temperatures at which they worked were not sufficiently removed from each other, there being only a difference of  $27^{\circ}$  C. between their maxima and minima. It is now, moreover, a demonstrated law that the existence of molecules of fixed composition can only be assumed when the vapor-density remains constant within a notable interval of temperature: hence a series of fresh determinations have been undertaken in the case of sulphur. Experiments conducted at  $518^{\circ}$  in a bath of vaporized pentasulphide of phosphorus by Dumas's method gave values averaging about 7.0, which are nearly coincident with Dumas's own. At the higher temperature of  $606^{\circ}$ , using a bath of stannous chloride vapor, the density had diminished to 4.7. At  $860^{\circ}$ , as is well known, sulphur vapor attains the normal constitution of two atoms to the molecule, and the density remains constant for about  $200^{\circ}$  higher still: hence, in order to finally set the question at rest, a series of ten determinations were made at intervals of about  $10^{\circ}$ – $15^{\circ}$  from  $468^{\circ}$  to  $606^{\circ}$ , with the conclusive result that the density regularly diminished from 7.9 at the former, to 4.7 at the latter temperature. Hence the notion of  $\text{S}_6$  is completely dissipated: there is no more experimental reason for it than there is for the existence of molecules of the constitution  $\text{S}_8$  or  $\text{S}_n$ . None but the value corresponding to the normal composition,  $\text{S}_2$ , stands the test of interval of temperature: therefore we must conclude that sulphur obeys the usual law, and that its molecules when completely vaporized are each composed of two atoms.

— The following comparison of several physical measurements of men belonging to the "upper professional classes, well fed, well clothed," with Cambridge students, suggests interesting reflections on the superiority of university men:—

	Height.	Pull.	Squeeze.	Breadth.	Weight.
Cambridge men.....	68.9	83	87.5	25.4	153.6
Non-university men..	67.9	74	85	21.9	143

— In *Wide Awake* for July, Sallie Joy White writes of Helen Keller, to whom we have already referred, "The ideas of death and burial had never been communicated to her; but, taken into a cemetery on account of some beautiful flowers there, she grew pale and grave, and put her little hand upon her teacher's eyes and her mother's, and spelled out 'cry, cry,' and her own eyes filled with tears. Her teacher says that one day when her brother was coming toward them, as they were walking, Helen knew it, spelled his name repeatedly, and started in the right direction to meet him; and that she gives the names of people she meets walking or riding as soon as their presence is recognized; and that often, when she is about to make known some plan, the child will anticipate her and spell out the very plan about to be unfolded. Whether this be the action of some sharpened sense already known to us and named, or the awaking and working of some sense not recognized and named, is interesting matter for study."

— G. Stanley Hall has accepted the presidency of Clark University, Worcester, Mass. The two following extracts, the first from the letter tendering the position, the second from Professor Hall's letter of acceptance, throw some light on what may be the policy

and character of the as yet unformed institution. The trustees write, "In the work to which you are thus called, the trustees promise you a hearty and unselfish co-operation. They desire to impose on you no trammels. They have no friends for whom they wish to provide at the expense of the interests of the institution, no pet theories to press upon you in derogation of your judgment, no sectarian tests to apply, no guaranties to require, save such as are implied by your acceptance of this trust. Their single desire is to fit men for the highest duties of life, and to that end that this institution, in whatever branches of sound learning it may find itself engaged, may be made a leader and a light. To this high purpose they have dedicated their university, and, in calling you to the first position of influence and authority for its accomplishment, they give you their present confidence, and the assurance of sympathy, co-operation, and support." Dr. Hall replied, "The work of organizing another college of the old New England type, or even the attempt to duplicate those that are best among the established institutions, old or new, would not induce me to leave. But as I have come to know the rare educational wisdom, as well as the rare munificence, of your founder; the single and express desire of the corporation, that, in whatever branches of sound learning it may engage, the new university may be a leader and a light; the many advantages of location afforded by your city, which seem to make the place of this great foundation no less auspicious than is the present time; the public co-operation, interest, and good-will of your citizens; and as I realize how these influences, once fairly organized, must tend in this day to still further university progress along old lines, and the opening of new ones,—I am drawn with hope and enthusiasm, too strong to resist, from this present to the future service to which you call me."

— The value and popularity of the general government exhibits at the great fairs in this country are becoming so universally recognized, that Congress is asked to authorize the sending of such exhibits to every important exhibition that is held. The latest applicant is the Virginia Agricultural, Mechanical, and Tobacco Exposition, to be held in Richmond from Oct. 3 to Nov. 21 of the present year. The sum asked for is twenty-five thousand dollars, five thousand each for the Agricultural Department and the Fish Commission, and fifteen thousand for the Smithsonian Institution and National Museum. It would be establishing a rather dangerous precedent to send a government exhibit to a State fair, for every other State in the Union will immediately demand that the interest in their State fairs shall be promoted by an appropriation by Congress.

— In a recording rain-gauge recently devised by M. Brassard, as described in *Nature*, the water passes from the bottom of the receiver into a centrally pivoted trough, having each arm slightly depressed in the middle. It fills the two divisions alternately. The filled arm goes down, and empties itself into a lower trough, and the rocking thus caused is registered by an ordinary counter. Each rocking of the trough indicates one-tenth of a millimetre of water having fallen into the receiver. The instrument is designed to eliminate the error usually arising from evaporation.

— Advices from the fishing-village of Kerschkaranza, in the Kola Peninsula, on the White Sea, state, according to *Nature*, that on Jan. 5 a curious and destructive phenomenon occurred there. At 4 A.M. the inhabitants were awakened by a peculiar, dull, heavy detonation like that of distant artillery. Piled up to a height of several hundred feet, the ice—in consequence, no doubt, of the enormous pressure of the ocean-ice without—was seen to begin moving from the north-west towards the shore. The gigantic ice wall moved irresistibly forward, and soon reached the shore and the village, which it completely buried, the ice extending a mile inland. The forward movement of the ice lasted four hours. No lives were lost.

— According to the report of the inspector of schools in Hong Kong for the past year, as noticed in *Nature*, the total number of schools subject to government supervision was 94, as against 45 in 1877 and 13 in 1867; the numbers of scholars for the corresponding years being respectively 5,974, 3,144, and 700. Of the 5,974 pupils who attended schools under government supervision in 1887, 4,160 attended missionary schools, and 1,814 the government undenominational establishments. In the colony there are five classes of

schools: (1) Chinese, where a purely Chinese education is given; (2) Romanized Chinese, in which a European education is given in the Chinese language; (3) Portuguese, where a European education is given in the Portuguese language only; (4) Anglo-Chinese schools, numbering eight, with 1,160 scholars; (5) English schools, numbering six, with 688 scholars, in which the children are taught in the English language only. The Government Central School presented 384 boys for the annual examination, and of these 375 passed; that is, the very high percentage of 97.65. At this latter school the subjects taught are reading, dictation, arithmetic, Chinese into English, English into Chinese, grammar, geography, map-drawing, composition, Euclid, algebra, mensuration, history, and Latin.

— *Nature* is authority for the statement that on April 29, when off the Westman Islands, Iceland, the captain of the Danish mail-steamer 'Laura' threw overboard a letter written in Danish. On May 6 the letter was found in the stomach of a cod caught by a French fisherman off Reykjanæs, about one hundred and twenty miles distant. The man showed it to the French consul at Reykjavik, who submitted it to the captain of the 'Laura.' It was much decomposed, but still readable.

— There being no provision in this country for the accurate comparison of electrical standards and apparatus, it has been decided to provide means for such measurements at Johns Hopkins University. The work will be under the general direction of Professor Rowland and under the immediate supervision of Dr. Duncan. The comparisons will be made by G. A. Liebig, Ph.D., who has been appointed assistant in electricity. The importance of such provision for the comparison of standards has been for some time recognized. Such representative bodies as the American Association for the Advancement of Science, and the National Electrical Conference, held in 1884 at Philadelphia, have discussed the possibility of a bureau of standards, and have favored its establishment. It is not probable that the government will take any steps in the matter, at least for the present, and, as time goes on, the need becomes more pressing. There is needed some laboratory where instruments can be compared with standards of undoubted correctness, by accurate methods and careful observers, under uniform and determinate conditions. These requirements are filled by the standards and apparatus in the possession of this university, and by the facilities and experience that the laboratory offers.

— A new and greatly improved edition of the photographic map of the normal solar spectrum, made by Prof. H. A. Rowland, extending from the extreme ultra-violet down to and including B to wave-length 6950, is now being printed. The old map, published in 1886, was made by means of a grating ruled on the old dividing-engine, which was originally intended for only small gratings. Furthermore, it was not printed in a sufficiently careful manner; and the negatives, which were originally none too good, soon became broken or defaced, so that many of the prints, especially the later ones, were not satisfactory. The whole work has now been gone over again. A new dividing-engine to rule large gratings has been constructed, and has proved to be superior in every way to the old one, although the old one is almost equal to it for small-size gratings. Several concave gratings of 6 inches diameter and 21½ feet radius have been ruled with 10,000 or 20,000 lines to the inch, giving definition hitherto undreamed of. Professor Rowland has devoted years to the making of dry plates, simple and orthochromatic, and is thus better prepared than before for the work of making the map. He has also revised his list of standard wave-lengths, and extended them into the ultra-violet, and has placed the scale upon the photographs with greater care than before.

— Bulletin No. 4 of the Ohio Agricultural Experiment Station discusses some elaborate experiments in preventing curculio injury to cherries, and treats in a practical way the best midsummer remedies for the chinch-bug, which has lately appeared in destructive numbers in Ohio. In the cherry experiment, which was conducted by the station entomologist, Clarence M. Weed, 22,500 cherries were individually cut open and examined, and the conclusion reached that three-fourths of the cherries liable to injury by the curculio can be saved, without danger to the user, by spraying with

a solution of London purple soon after the blossoms fall. This bulletin will be sent free to any Ohio farmer who will address Ohio Agricultural Experiment Station, Columbus, O.

— At a meeting of the Paris Academy of Sciences, July 2, there was presented a series of drawings of the planet Mars made by M. Perrotin, director of the observatory at Nice. In the discussion which followed, M. Fizeau offered an explanation of the singular canals observed on the surface of Mars, which resemble slightly canals used for irrigation. The explanation which he gives is, that on the surface of Mars there must be large glaciers similar to those which exist on the earth, but of an extent far greater, and that the movements and crevasses are much more pronounced. This hypothesis, as M. Fizeau claims, accords perfectly with our present knowledge of the planet. We know, first, that the seasons are twice as long as on the earth; second, that the force of gravity is feeble; third, that the temperature is probably much lower than that of the earth; and, fourth, that the atmosphere is less developed than that of the earth, less extended, and consequently less able to absorb and preserve the solar heat.

— The Royal Society of New South Wales offers its medal and a money prize for the best communication (provided it be of sufficient merit) containing the results of original research or observation upon each of the following subjects: — to be sent in not later than May 1, 1889, 'On the Chemistry of the Australian Gums and Resins' (the society's medal and £25), 'On the Aborigines of Australia' (the society's medal and £25), 'On the Iron-Ore Deposits of New South Wales' (the society's medal and £25), 'List of the Marine Fauna of Port Jackson, with Descriptive Notes as to Habits, Distribution, etc.' (the society's medal and £25); to be sent in not later than May 1, 1890, 'Influence of the Australian Climate, General and Local, in the Development and Modification of Disease' (the society's medal and £25), 'On the Silver-Ore Deposits of New South Wales' (the society's medal and £25), 'On the Occurrence of Precious Stones in New South Wales, with a Description of the Deposits in which They are found' (the society's medal and £25). The competition is in no way confined to members of the society, nor to residents in Australia, but is open to all without any restriction whatever, excepting that a prize will not be awarded to a member of the council for the time being; neither will an award be made for a mere compilation, however meritorious in its way. The communication, to be successful, must be either wholly or in part the result of original observation or research on the part of the contributor.

— Senator Hoar, in his recent oration at the Marietta centennial, spoke of the Ordinance of 1787, by which the North-west Territory was established, as "one of the three little deeds of American constitutional liberty." "It belongs," he said, "with the Declaration of Independence and the Constitution." Yet how many Americans, even good scholars, have ever read the Ordinance of 1787? Few would know where to look for it, and, looking, would probably find it only in the appendix to some obscure and dusty volume. Many, therefore, at this time will be glad to know that the directors of the 'Old South Studies' have incorporated it in their new general series of 'Old South Leaflets,' which are published for schools and the trade by D. C. Heath & Co., Boston, and that it is now ready for distribution. These 'Old South Leaflets,' which sell for the small price of five cents a copy or three dollars per hundred, are the means of bringing a great number of important original documents into the service of our historical students. — Ginn & Co. will publish shortly a 'Manual of Astronomy,' by Prof. C. A. Young of Princeton College. — The first number of a new monthly journal devoted to physics was published in St. Petersburg in May. The object of this journal is to give each month a *résumé* of progress in the science. — E. & J. B. Young & Co. will publish shortly 'The Last Journals of Bishop Hannington.' The volume will be somewhat a continuation of the 'Memoirs of Bishop Hannington,' though, of course, treating altogether of the later years of his life, and of his work in Africa. — G. P. Putnam's Sons have in preparation 'Omitted Chapters of History Disclosed in the Life and Papers of Edmund Randolph, Governor of Virginia, First Attorney-General United States, Secretary of State, etc.,' by Moncure D. Conway. The volume will contain copies of a large number of

unpublished documents from the British and French foreign offices. — George Routledge & Sons will publish shortly 'The Handy Reference Atlas of the World,' by John Bartholomew, containing 100 maps and plans, a complete index, and geographical statistics. — D. C. Heath & Co. have ready a collection of twenty-five models and twenty-five photographs by N. S. Shaler, William M. Davis, and T. W. Harris, instructors in geology in Harvard College, designed to show the principal features in the structure of the superficial aspects of the earth's crust, with extensive text descriptive of each figure, prepared for the use of beginners in geology. This collection is now in use in the laboratory of Harvard College, by the Boston School of Natural History, and a dozen other schools of various grades. Messrs. Heath & Co. will also publish very soon an 'Illustrated Primer,' by Sarah Fuller, principal of the Horace Mann School for the Deaf, Boston. The aim of this little book is to familiarize the deaf children with the printed forms of words and sentences which they have learned to speak. To associate these with the objects, there are introduced many simple cuts of common objects with which the pupils are acquainted. — Harper & Brothers have just issued a handsomely illustrated work, entitled 'The Capitals of Spanish America,' by W. E. Curtis, in which all the great cities in the central and southern parts of this Western continent are described at length, and their ancient history retold. — 'The Injurious Influences of City Life' is the subject of a brief but striking paper, by Walter B. Platt, M.D., to appear in the August *Popular Science Monthly*. The limitation of muscular movements, the noise, and the pavements in a city, are the principal sources of the effects to which he refers. — Messrs. Eyre & Spottiswoode, London, have issued two new volumes of the 'Report on the Scientific Results of the Voyage of the "Challenger,"' — Vol. XXIV., 'Zoölogy (2 parts, text and plates), Report on the Crustacea Macrura;' Vol. XXV., 'Zoölogy, Report on the Tetractinellida.' — Roberts Brothers have just ready 'Harvard Vespers,' a collection of the sermons preached to the students by Phillips Brooks, E. E. Hale, A. P. Peabody, and Dr. Gordon, of the Old South, Boston. — D. C. Heath & Co. will publish shortly some selected poems from Lamartine's 'Premières et Nouvelles Méditations.' They will be edited, with biographical sketch and notes, by George O. Curme, professor of German and French, Cornell College, Mount Vernon, Io. — The University Publishing Company will hereafter publish Prof. A. Knoflach's works on 'German Simplified' and 'Spanish Simplified.' These works, heretofore published by the author, have had a fair sale, which it is hoped will be extended by the transfer to an enterprising firm like the University Publishing Company. — Funk & Wagnalls have just ready 'Nobody Knows,' by A Nobody, which deals with what the author calls 'social wrongs.' — Houghton, Mifflin, & Co. announce 'Political Essays,' by James Russell Lowell, which will doubtless attract remarkable attention. Most of the essays date back to the time of the war and the reconstruction which followed. The closing paper is his New York address in April last, on 'The Place of the Independent in Politics.' — Harper & Bros. have issued 'The Names and Portraits of Birds which interest Gunners,' containing descriptions of birds generally shot in the eastern portion of the United States, and giving the different names by which they are commonly known in other parts of the country.

— At a meeting of the French Academy of Sciences, July 2, Prof. S. P. Langley was elected a corresponding member.

— In June, 1887, a committee of the Howard Association invited the co-operation of their friends and the public to enable them to issue, and distribute at home and abroad, certain works which their secretary, Mr. Tallack, had prepared, embodying important facts, figures, and observations collected by the association during the past twenty years, in reference to prison discipline and the best methods of the treatment and prevention of crime, together with the questions of intemperance and capital punishment. The works alluded to are now nearly ready for the press, and are three in number. It is hoped that they may each be issued during the year 1888. The contents of two of these books will include the following subjects: — 'Prison Discipline, and the Best Modes of the Treatment and Prevention of Crime,' including chapters on the existing British, continental, and American systems of prison and penal

discipline; separation and association in jails; prison visitation; penal labor; prison officers; the police; imprisonment for long terms and for life; the aid of discharged prisoners; habitual offenders; probation and conditional liberation; juvenile delinquency; reformatory and industrial schools; pauper children; sentences; various modes of punishment and prevention, etc.: and 'The Death-Penalty at Home and Abroad,' including chapters on the limits and operation of deterrence and penalty; British and foreign official statistics of murder and its punishment; judicial mistakes; insanity and homicide; the law of murder; American homicide; the prerogative of pardon; modes of execution; the abolition of capital punishment, regular and irregular; perverted clemency; substitutes for the infliction of death; alternative dangers; the opinions, on this question, of John Stuart Mill, Justice Sir Fitzjames Stephen, Lord Bramwell, Prince Bismarck, Earl Russell, Right Hon. Joseph Henley, M.P., Right Hon. John Bright, M.P., King Oscar I., and others; the Bible and capital punishment, etc. The above appeal has been widely issued in the form of a circular. It has hitherto only elicited £62 4s., and this sum has been exclusively contributed by eleven friends who were previously subscribers to the association, and familiar with its services. It is obvious that much more effectual help is necessary to enable the committee to carry out their wishes.

— Germany is taking an interest in the exploration of the Antarctic regions. An expedition is being organized by Dr. Neumayer of the Hamburg Observatory.

#### LETTERS TO THE EDITOR.

##### Onondaga White-Dog Feast.

DANIEL LA FORT testified before the legislative committee this month that the Onondagas burned no white dog this year, because the Indian breed had run out. He told me soon after the feast, which occurred as usual, minus the dog, that it was a sacred breed, and no others could be used; and I think none was burned last year. Of course, this is partially an excuse for letting the custom die out, as Indian dogs could be procured from other Iroquois if so desired. The feast has fallen into decay, though its observance in some ways will continue a while longer. The presumption is, that some intelligent Indians are assisting in its gradual disuse. This decay has been quite marked in this generation. Forty years ago, two dogs were burned; twenty years ago, but one, but this was on a blazing pile outside the council-house. Five years ago they opened the top of the council-house stove, and dumped the dead victim into that. Now there is no dog at all.

The last feast attracted some antiquarians from a distance, who were much disappointed at the omission, — Hamlet, with Hamlet left out, — but there was no remedy. The dog had had its day.

It is customary to call this an ancient feast, and to suppose it identical with the white-dog feast of the Senecas, which it much resembles. I have before now pointed out the differences, one of the principal of which is the time at which the dog is killed. With the Senecas this was at the beginning of the principal feast-day, and it remained hung up until the fifth, when it was taken down and burned. Among the Onondagas the killing and burning were always on the same day. The Onondagas had such a sacrifice but once a year; the Senecas, on any important occasion, sacrificing several dogs during Sullivan's invasion in 1779. With them the custom seems but little over a century old, the Onondagas adopting it later, while the other nations may not have had it at all. At least, it has been described only in these two, and that but at a late day. The Onondagas simply added a striking rite to their earlier dream-feast, which had the periodical observance of the later dog-feast. That they had it from the Senecas seems reasonable; but whence the latter obtained it is not so clear. It may prove a late outgrowth of earlier customs, dog's-flesh having been always highly esteemed by the Indians. Unknown, apparently, to the French missionaries, it is already among the things that have been. In a very short time the other rites of the feast will disappear, as feasts themselves have been dropped. I recently had the good fortune to be present at the Onondaga planting-feast, which has never been described.

W. M. BEAUCHAMP.

Baldwinsville, July 12.